Immune and Autoimmune Responses to cytosolic DNA and RNA

Zhijian 'James' Chen, Ph.D.
Investigator, Howard Hughes Medical Institute
Professor, Department of Molecular Biology
University of Texas Southwestern Medical Center
Dallas, TX 75390
USA

Short abstract:

The presence of DNA and aberrant RNA in the cytoplasm is a danger signal that alerts the host immune system to eliminate microbial infections, but inappropriate activation of these pathways can also lead to autoimmune diseases. In this seminar, I will first summarize our work on the biochemical dissection of the RIG-I pathway, which detects microbial RNA in the cytoplasm, and then focus on the more recent work on the discovery of a new innate immune sensor called cGAS that detects cytosolic DNA, and a novel second messenger called cyclic GMP-AMP (cGAMP) that triggers the production of type-I interferons and other inflammatory cytokines. I will also discuss the potential of targeting the cGAS-cGAMP pathway in the development of vaccines and therapies of human diseases such as lupus.